

WHAT IS CLAIMED IS:

1 1. A method for specifically delivering an
2 effector molecule to a tumor cell bearing a polypeptide
3 antigen of at least 10 contiguous amino acids from the
4 polypeptide sequence of SEQ. I.D. NO. 2, wherein said
5 polypeptide binds to antisera raised against the full-length
6 polypeptide of SEQ. I.D. NO. 2 as an immunogen, which has been
7 fully immunosorbed with a 40 kD polypeptide (the K1 antigen)
attached to the cell surface of OVCAR-3 and HeLa cells
("mesothelin"), said method comprising:

providing a chimeric molecule comprising said
effector molecule attached to a targeting molecule that
specifically binds to mesothelin; and

contacting said tumor with said chimeric molecule;
wherein said chimeric molecule specifically binds to a tumor
cell.

1 2. The method of claim 1, wherein said targeting
2 molecule is an antibody to mesothelin.

1 3. The method of claim 1, wherein said tumor is an
2 ovarian tumor cell.

1 4. The method of claim 1, wherein said effector
2 molecule is selected from the group consisting of a cytotoxin,
3 a label, a radionuclide, a drug, a liposome, a ligand, and an
4 antibody.

1 5. The method of claim 1, wherein said effector
2 molecule is a *Pseudomonas* exotoxin.

1 6. A method for impairing growth of tumor cells
2 bearing a polypeptide antigen of at least 10 contiguous amino
3 acids from the polypeptide sequence of SEQ. I.D. NO. 2,
4 wherein said polypeptide binds to antisera raised against the
5 full-length polypeptide of SEQ. I.D. NO. 2 as an immunogen,
6 which has been fully immunosorbed with a 40 kD polypeptide

7 (the K1 antigen) attached to the cell surface of OVCAR-3 and
8 HeLa cells ("mesothelin"), said method comprising contacting
said tumor with a chimeric molecule comprising:

a targeting molecule that specifically binds
mesothelin; and

an effector molecule selected from the group
consisting of a cytotoxin, a radionuclide, a ligand and an
antibody; wherein said chimeric molecule specifically binds to
a tumor cell.

1 7. The method of claim 6, wherein said cytotoxin
2 is selected from the group consisting of *Pseudomonas* exotoxin,
3 ricin, abrin and *Diphtheria* toxin.

1 8. The method of claim 6, wherein said tumor cell
2 growth is tumor cell growth in a human.

1 9. The method of claim 6, wherein said contacting
2 comprises administering said chimeric molecule to the human
3 intravenously, into a body cavity, or into a lumen or an
4 organ.

1 10. A method for detecting the presence or absence
2 of a tumor bearing a polypeptide of at least 10 contiguous
3 amino acids from the polypeptide sequence of SEQ. I.D. NO. 2,
4 wherein said polypeptide binds to antisera raised against the
5 full-length polypeptide of SEQ. I.D. NO. 2 as an immunogen,
6 which has been fully immunosorbed with a 40 kD polypeptide
7 (the K1 antigen) attached to the cell surface of OVCAR-3 and
8 HeLa cells ("mesothelin"), said method comprising contacting
9 said tumor with a chimeric molecule comprising:

10 a targeting molecule that specifically binds
11 mesothelin; and a detectable label; and detecting the presence
12 or absence of said label.

1 11. A pharmacological composition comprising a
2 pharmaceutically acceptable carrier and a targeting molecule
3 that specifically binds to a polypeptide of at least 10

4 contiguous amino acids from the polypeptide sequence of SEQ.
5 I.D. NO. 2, wherein said polypeptide binds to antisera raised
6 against the full-length polypeptide of SEQ. I.D. NO. 2 as an
7 immunogen, which has been fully immunosorbed with a 40 kD
8 polypeptide attached to the cell surface of OVCAR-3 and HeLa
9 cells (the K1 antigen) in a therapeutically effective dose.

1 12. The pharmacological composition of claim 11,
2 wherein the targeting molecule is further joined to an
3 effector molecule to form a chimeric molecule.

1 13. The composition of claim 12, wherein said
2 effector molecule is selected from the group consisting of a
3 cytotoxin, a label, a radionuclide, a drug, a liposome, a
4 ligand, and an antibody.

1 14. The composition of claim 12, wherein the
2 chimeric molecule is a single-chain fusion protein.

1 15. A kit for the detection of mesothelin
2 comprising a container having a nucleic acid or an antibody
3 specific for a polypeptide of at least 10 contiguous amino
4 acids from the polypeptide sequence of SEQ. I.D. NO. 2,
5 wherein said polypeptide binds to antisera raised against the
6 full-length polypeptide of SEQ. I.D. NO. 2 as an immunogen,
7 which has been fully immunosorbed with a 40 kD polypeptide
8 (the K1 antigen) attached to the cell surface of OVCAR-3 and
9 HeLa cells ("mesothelin") and instructional material for the
10 detection of tumor cells bearing mesothelin.

1 16. A method for the inhibition of mesothelin
2 expression or activity comprising contacting mesothelin
3 bearing cells with inhibitory nucleic acids specific for the
4 nucleic acid sequence set out in SEQ. I.D. NO. 1.

1 17. A vaccine for the inhibition or prevention of
2 mesotheliomas or ovarian tumors comprising administering a
3 mesothelin derived antigen to a patient.

1 18. A method to screen drugs for treatment of tumor
2 cells bearing mesothelin comprising subjecting a mammal
3 containing transplanted tumor cells transfected with a nucleic
4 acid sequence substantially identical to a sequence of SEQ ID
5 No. 1 to a drug of interest, and monitoring tumor cell
6 activity.

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